ONTARIO MINISTRY OF ENVIRONMENT
36936000020967

1966 OPERATING SUMMARY

Brampton-Chinguacousy

water pollution control plant

TD
367
.A56
B734
1966
MOE

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
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1966

Brampton - Chinguacousy :
water pollution control plant.
81773

ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Mayor and Members of Council,
Town of Brampton.

Reeve and Members of Council
Township of Chinguacousy.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the Brampton-Chinguacousy Water Pollution Control Plant, OWRC Project No. 58-S-14.

It is hoped that our joint participation in efforts to combat water pollution will have even more success in the coming year.

Yours very truly,

D. S. Caverly,
General Manager.

MOE
BRA
WAT
1966
NSA

nsfa

ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET
TORONTO 5

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D. S. CAVERLY
GENERAL MANAGER
W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Brampton-Chinguacousy Water Pollution Control Plant, OWRC Project No. 58-S-14.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

B C Palmer

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

Environment Ontario
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125 Resources Rd.
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FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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BRAMPTON – CHINGUACOUSY

water pollution control plant

operated for

THE TOWN OF BRAMPTON

and

THE TOWNSHIP OF CHINGUACOUSY

by the

ONTARIO WATER RESOURCES COMMISSION

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'66 REVIEW

The cost per million gallons treated rose to $78.94. This increase was due to the haulage of much more liquid sludge, as a result of the digesters being overloaded. Little or no solids separation was obtained, and site disposal was impossible because the plant enlargement was under construction.

The total measure plant flow was 956.599 million gallons, an increase of 17% over 1965. The increase in flow was actually more than 17% but because the measuring devices were also overloaded, there was not an accurate method of determining the amount by-passed. The rate of flow during daylight hours frequently exceeded 5.0 mgd.

The strength of the raw sewage was higher in BOD and SS than normal, with the result that high removal efficiencies were obtained. There were 94% for BOD and 95% for SS. Regular inspections were carried out by engineers and technicians from Head Office.

For most of 1966 the plant was staffed by a chief operator, four operators and a casual labourer. The operation is supervised 16 hours per day, 7 days per week.

Work on the 3 mgd plant extension was underway throughout 1966. A superintendent was brought on staff late in the year in preparation for the enlarged operation.

PROJECT COSTS

LONG TERM DEBT TO OWRC	
Brampton	$ 871,386.00
Chinguacousy	$ 106,589.00
Total Capital Cost (Estimated)	$ 977,975.00
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966:	
Brampton	$ 154,869.80
Chinguacousy	$ 7,666.16
	$ 162,535.96

The total cost to the municipalities during 1966 was as follows:

Net Operating		
Brampton	$37,385.75	
Chinguacousy	46,727.19	$ 84,112.94
Debt Retirement		
Brampton	$17,585.00	
Chinguacousy	2,151.00	$ 19,736.00
Reserve		
Brampton	$ 4,804.37	
Chinguacousy	2,364.16	$ 7,168.53
Interest Charged		
Brampton	$49,007.43	
Chinguacousy	9,182.35	$ 58,189.78
TOTAL		$ 169,207.25

RESERVE ACCOUNT

Balance at January 1, 1966:		
Brampton	$34,447.16	
Chinguacousy	15,928.80	$ 50,375.96
Deposited by Municipalities		
Brampton	$ 4,804.37	
Chinguacousy	2,364.16	$ 7,168.53
Interest Earned		
Brampton	$ 1,983.86	
Chinguacousy	890.84	$ 2,874.70
		$ 60,419.19
Less Expenditures		2,470.72
Balance at December 31, 1966		$ 57,948.47

TOTALS FOR EACH MUNICIPALITY

Total Cost:	Brampton	$ 108,782.55
	Chinguacousy	60,424.70
		$ 169,207.25
Reserve Account:	Brampton	$ 40,000.03
	Chinguacousy	17,948.44
		$ 57,948.47

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	3992.55	1550.58	288.56	583.09		(12.00)		11.97	1570.35	
FEB	5039.20	1696.82	354.41	540.93	448.05	72.48	17.43	66.63	1600.77	241.68
MARCH	4824.27	1688.10	274.16	458.39		61.14	210.47	100.65	2031.36	
APRIL	4977.54	2513.06	432.84	494.48	896.10	76.29	148.50	17.22	399.05	
MAY	8851.19	1929.74	288.56	466.70	456.75	213.43	90.89	10.20	5099.65	295.27
JUNE	4901.11	2287.65	288.56	440.28	456.75	70.11		581.06	776.70	
JULY	7464.45	2330.86	477.02	462.55	685.13	143.98		38.72	2943.36	382.83
AUG	6265.56	1147.19	602.32	446.22	456.75	89.35		325.24	3198.49	
SEPT	6002.57	2842.00	798.73	436.72	685.13	21.65		9.06	519.33	689.95
OCT	6904.24	1769.38	409.03	527.27	456.75	107.33			3634.48	
NOV	5863.06	1721.22	287.96	426.33	961.34	158.20		394.08	1272.59	641.34
DEC	10428.26	2277.35	287.96	521.92	913.50	144.94		81.90	5405.78	794.91
TOTAL	75514.00	23753.95	4790.11	5804.88	5416.25	1146.90	467.29	1636.73	28451.91	3045.98

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $22,781.05

BRACKETS INDICATE CREDIT

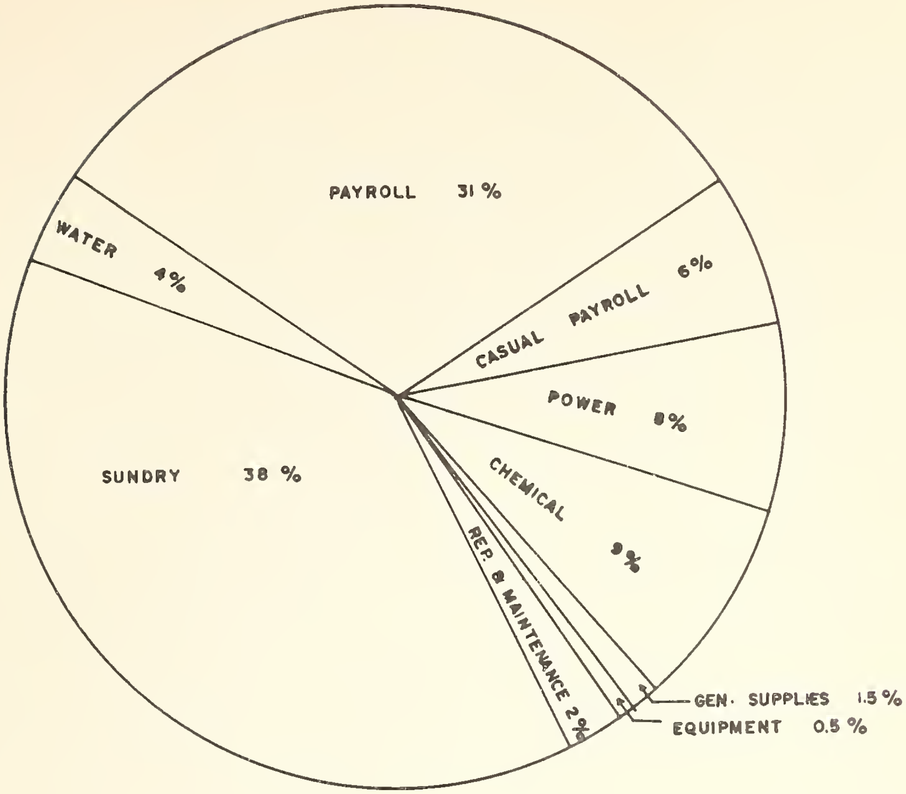
** DOES NOT INCLUDE COST OF OPERATING PUMPING STATION, WHICH WAS $8,598.94

YEARLY OPERATING COSTS

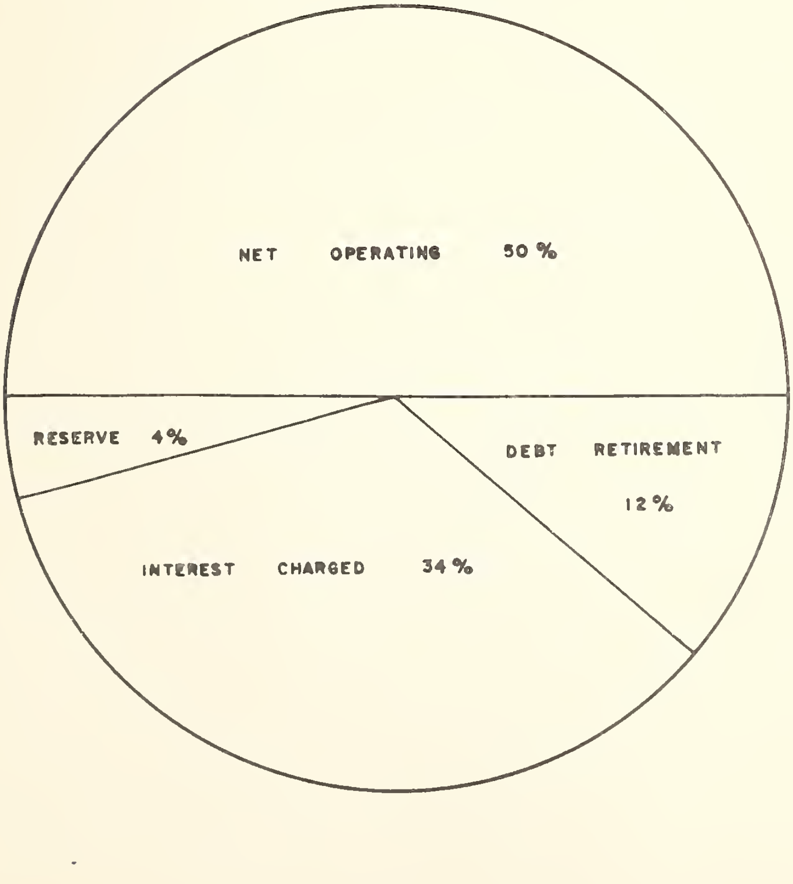
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1961	345.128	$25295.74	* $5.66	$73.30	3 CENTS
1962	441.847	27441.44	5.78	62.20	2 CENTS
1963	539.173	29054.11	5.11	53.90	1 CENT
1964	810.463	41489.00	6.16	51.19	1 CENT
1965	956.142	55678.76	7.25	66.27	2 CENTS
1966	956.599	75514.00	7.37	78.94	2 CENTS

*BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST



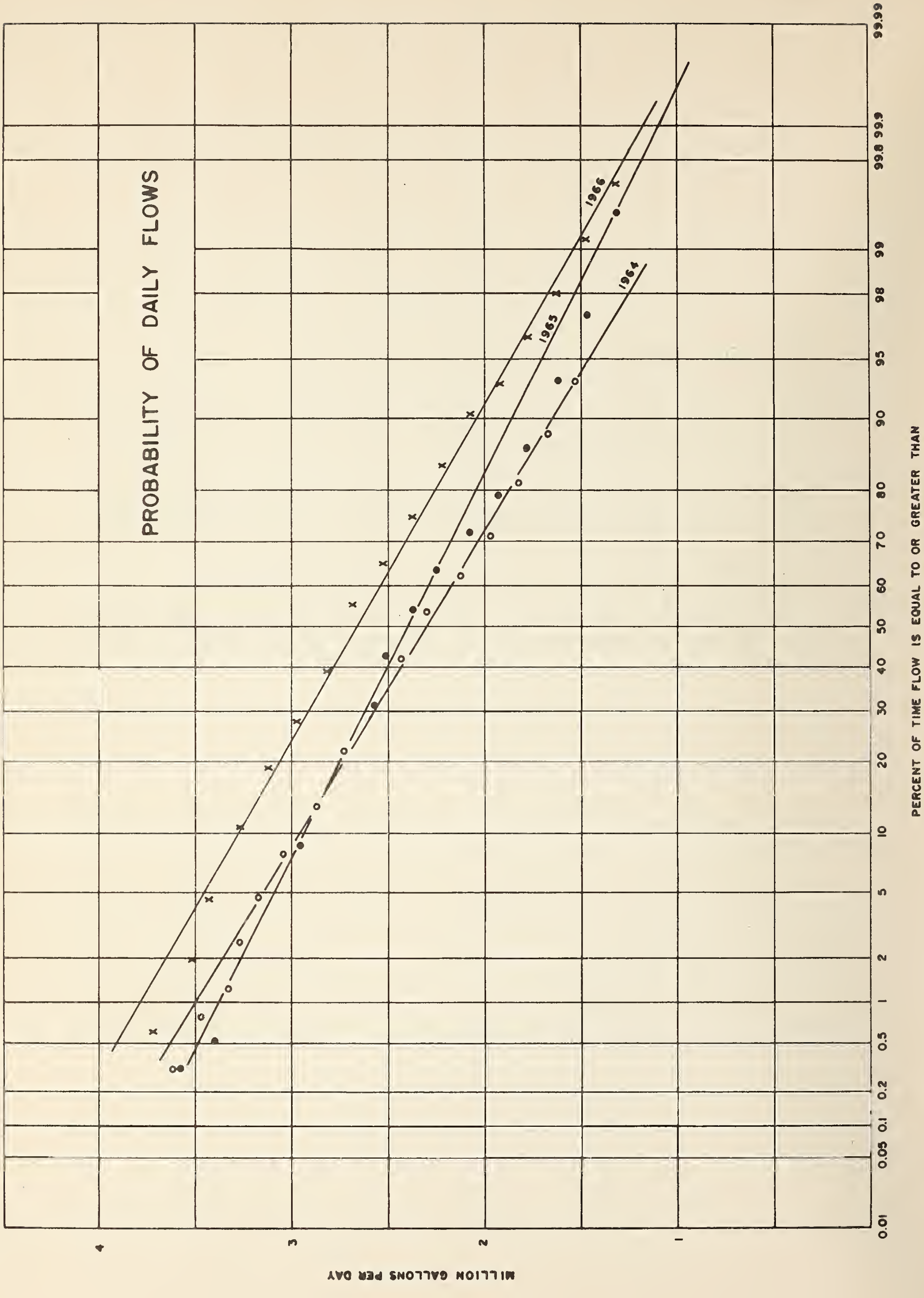
Process Data

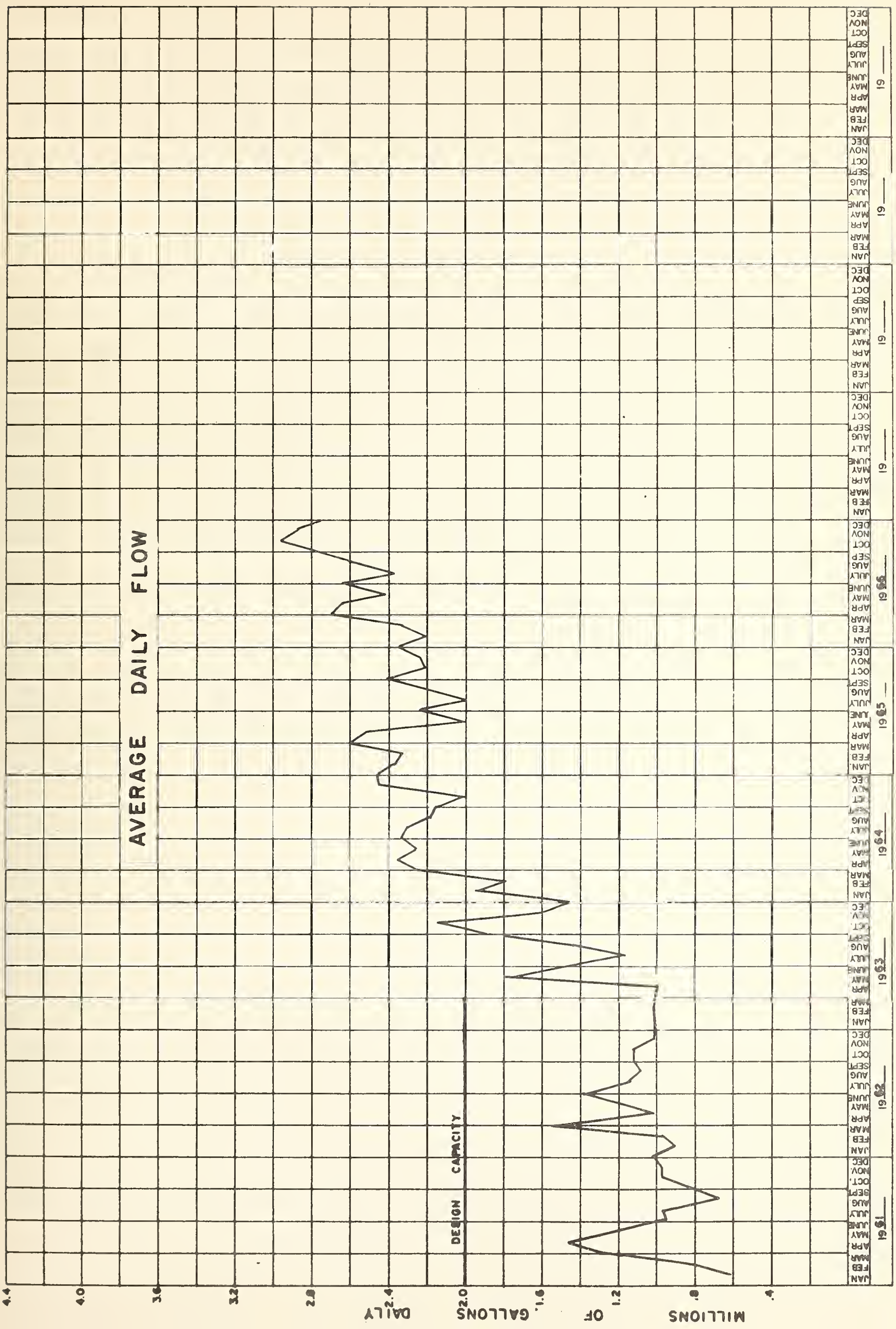
The maximum 24-hour flow recorded in 1966 was 3.757 million gallons on the week ending November 3, 1966.

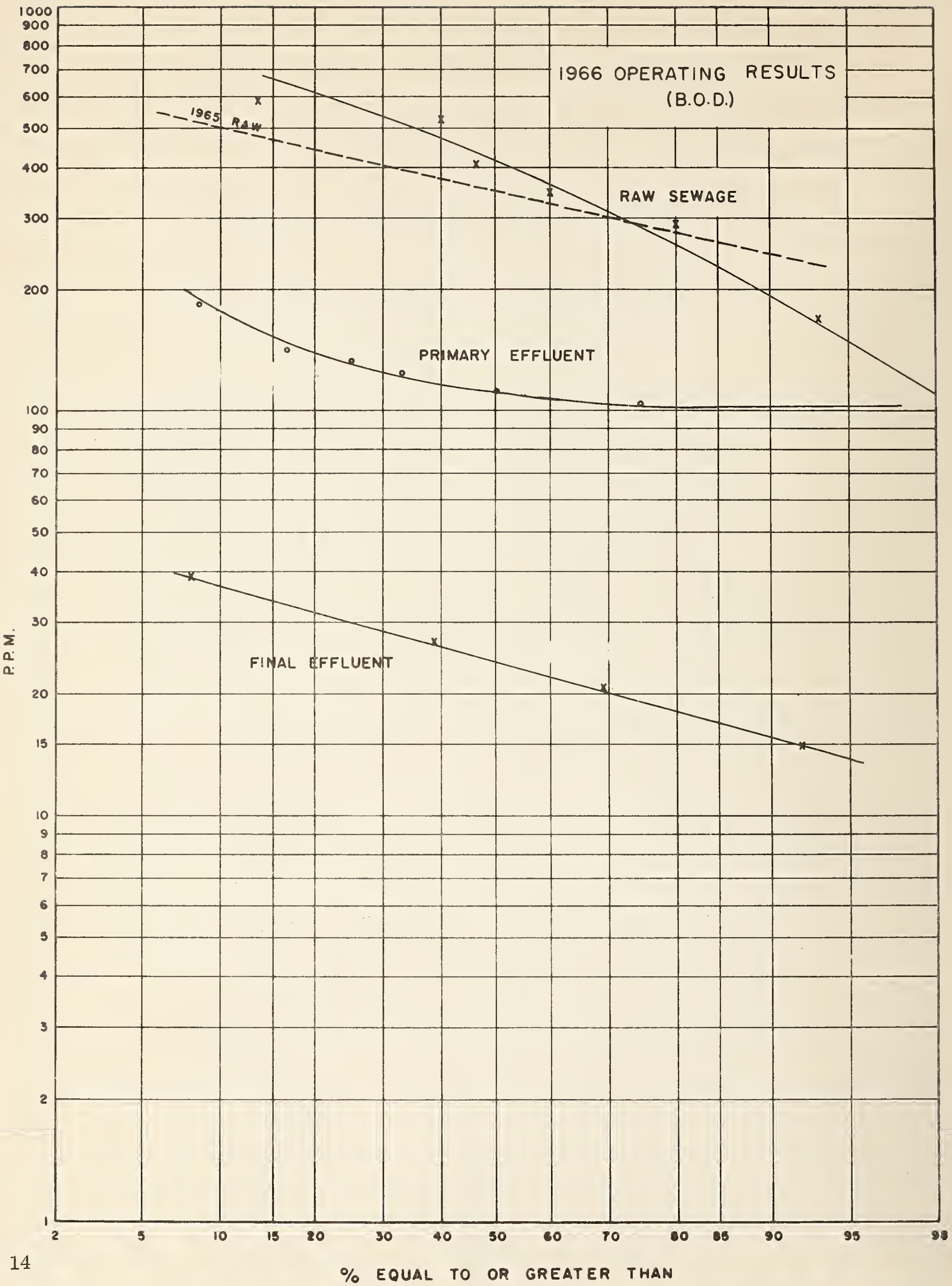
However, the flow was much higher than this recorded figure since daylight flows are beyond the existing meter capacity. Other estimates place the maximum flows close to 5 mgd.

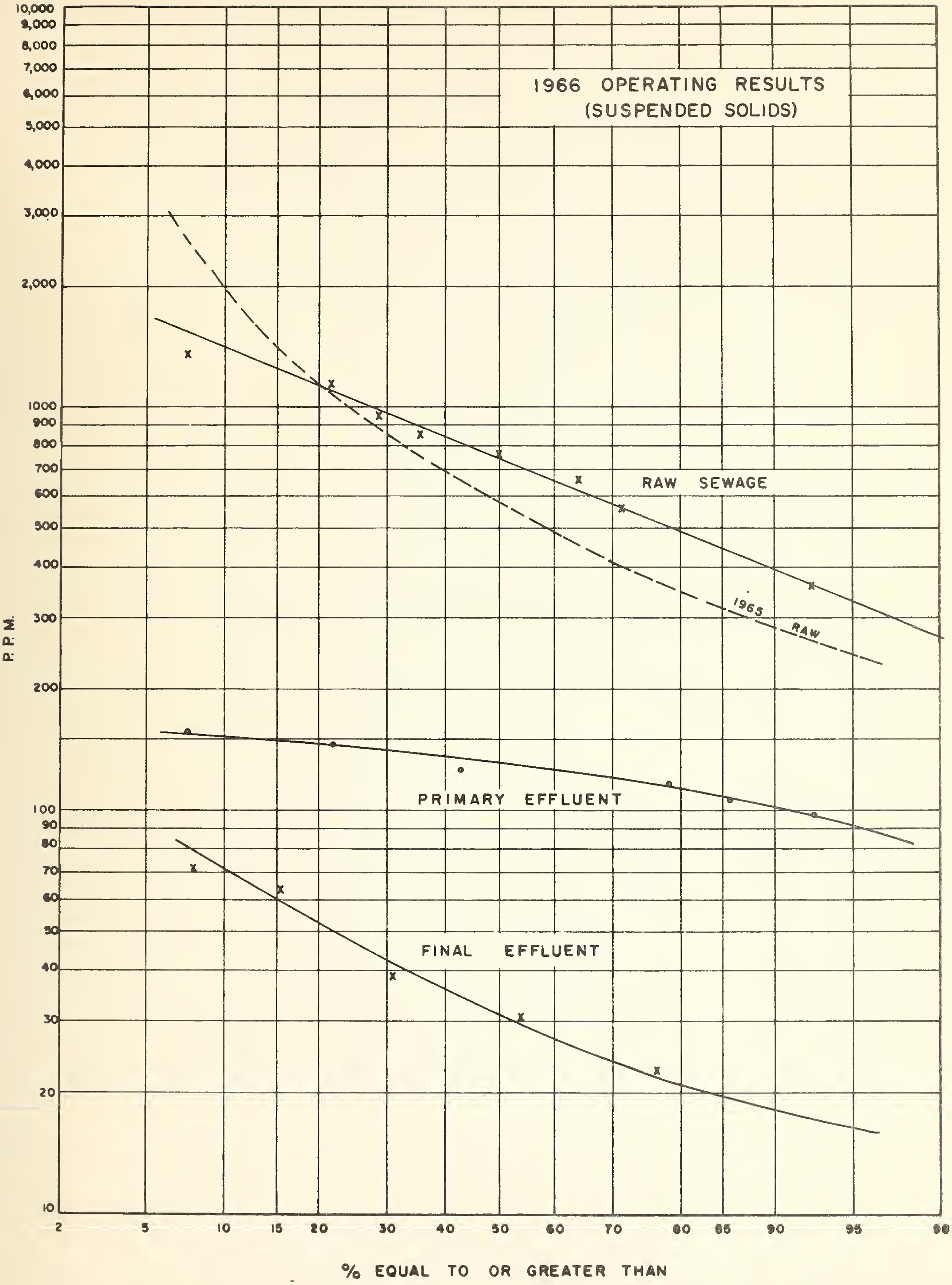
There was a 17% increase in recorded flows in 1966 over 1965.

From the graph of probability of daily flows it can be seen that the daily flows exceeded the design capacity of the plant 92 percent of the time.


PROBABILITY OF DAILY FLOWS


AVERAGE DAILY FLOW
DESIGN CAPACITY
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
.8
.4
MILLIONS OF GALLONS DAILY
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT. NOV. DEC
1961
1962
1963
1964
1965
1966
19
19
19
19


1966 OPERATING RESULTS
(B.O.D.)
1965 RAW
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P.P.M.
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
% EQUAL TO OR GREATER THAN


1966 OPERATING RESULTS
(SUSPENDED SOLIDS)
RAW SEWAGE
1965 RAW
PRIMARY EFFLUENT
FINAL EFFLUENT
P. P. M.
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
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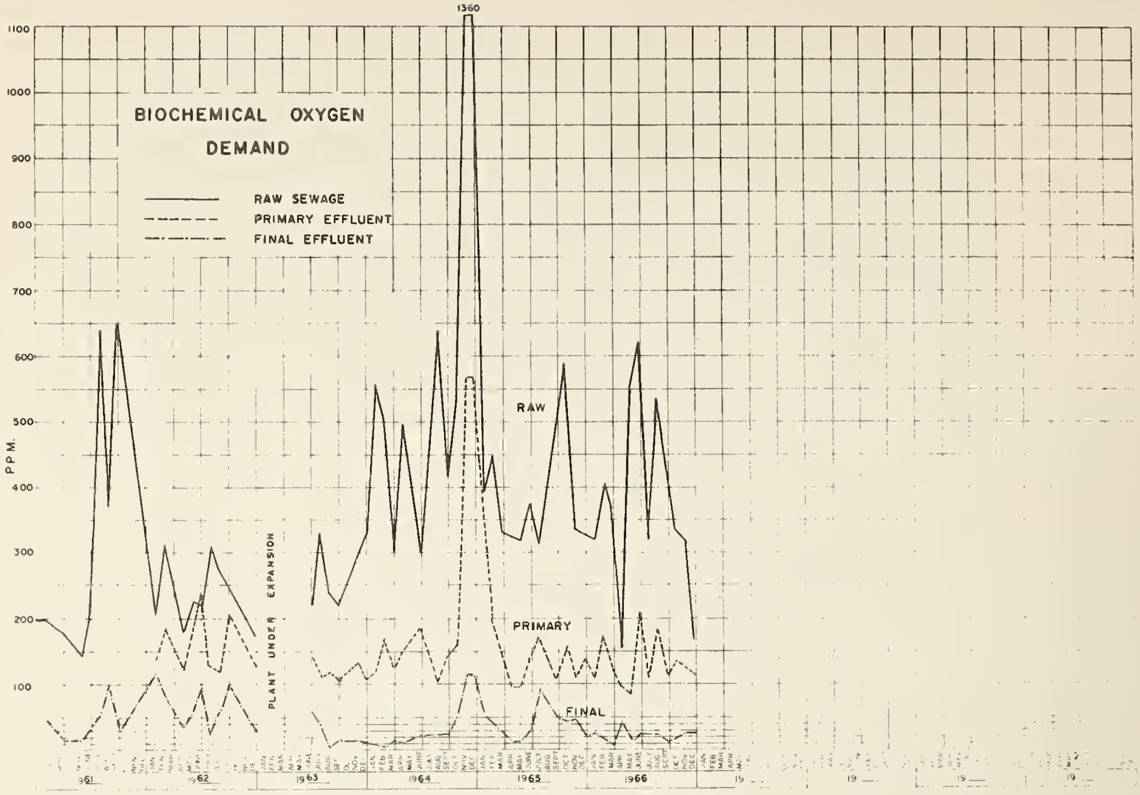
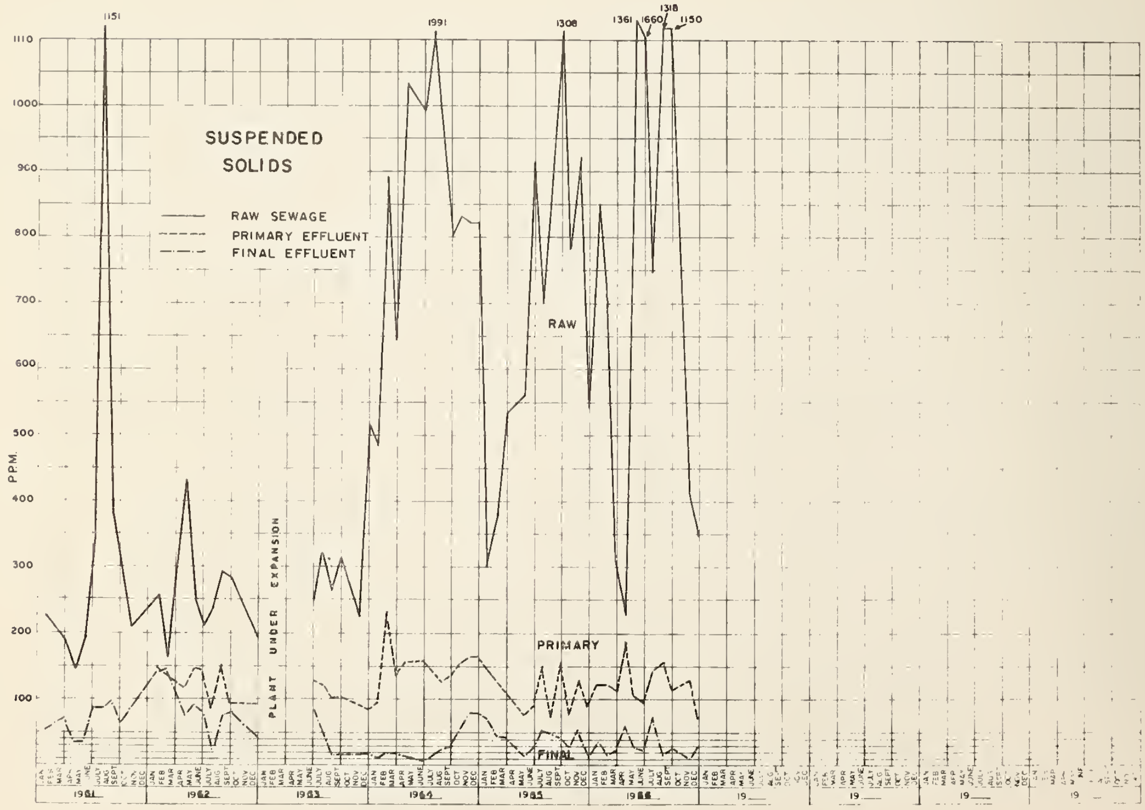
50
60
70
80
85
90
95
98
% EQUAL TO OR GREATER THAN



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

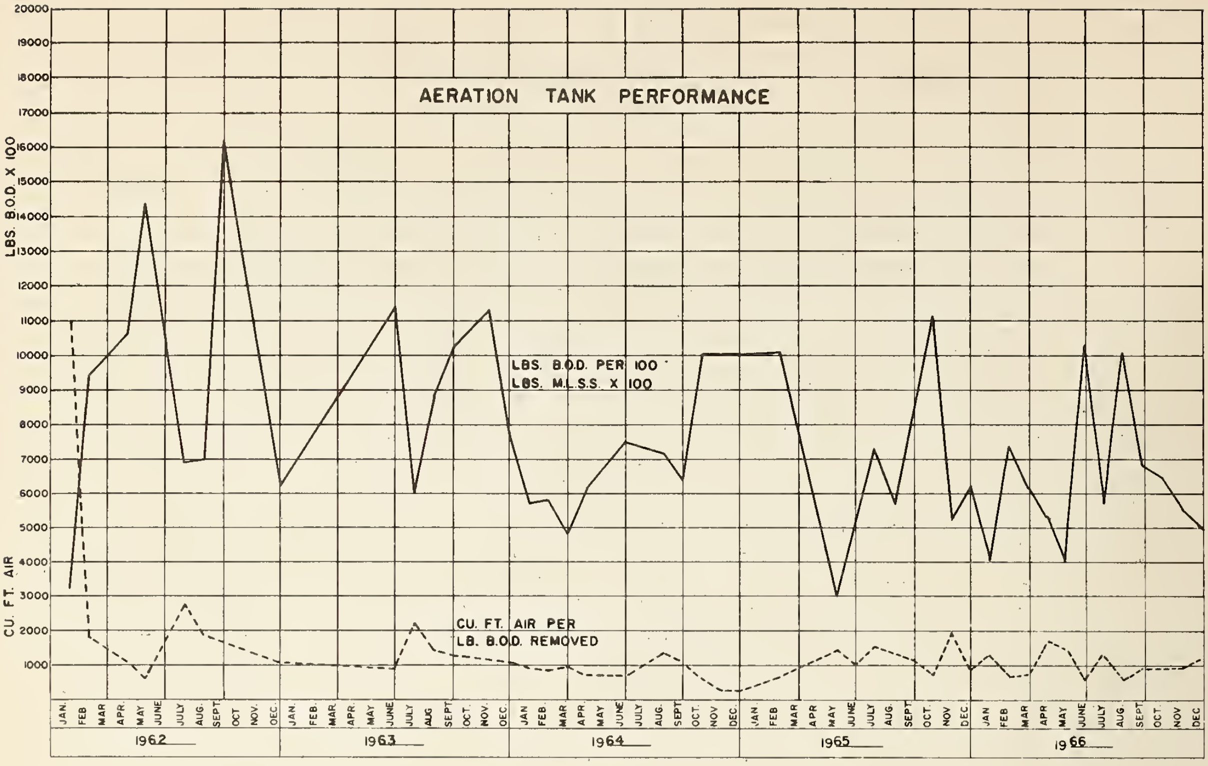
MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	320	25	92.0	100.9	850	37	95.5	278.1	567
FEB.	410	18	95.6	129.9	699	18	97.5	223.0	621
MAR.	370	9.6	97.5	153.5	316	26	92.0	123.5	756
APR.	155	40	74.0	45.8	230	60	74.0	66.8	621
MAY	550	17	97.0	201.0	1361	29	98.0	502.3	621
JUNE	620	24	96.0	236.5	1160	24	98.0	450.8	621
JULY	320	26	92.0	109.2	742	74	90.0	248.2	567
AUG.	540	24	95.5	209.7	1318	18	98.5	528.2	621
SEPT.	410	14	96.5	166.2	1158	29	97.5	473.7	621
OCT.	335	*23	93.0	144.6	678	*33	95.0	299.0	702
NOV.	317	26	92.0	125.8	419	11	97.5	176.3	648
DEC.	155	26	83.0	54.4	346	34	90.0	131.6	675
TOTAL	-	-	-	1683.6	-	-	-	3539.4	7641
AVG.	375	23	94.0	140.3	773	33	95.5	295.0	637

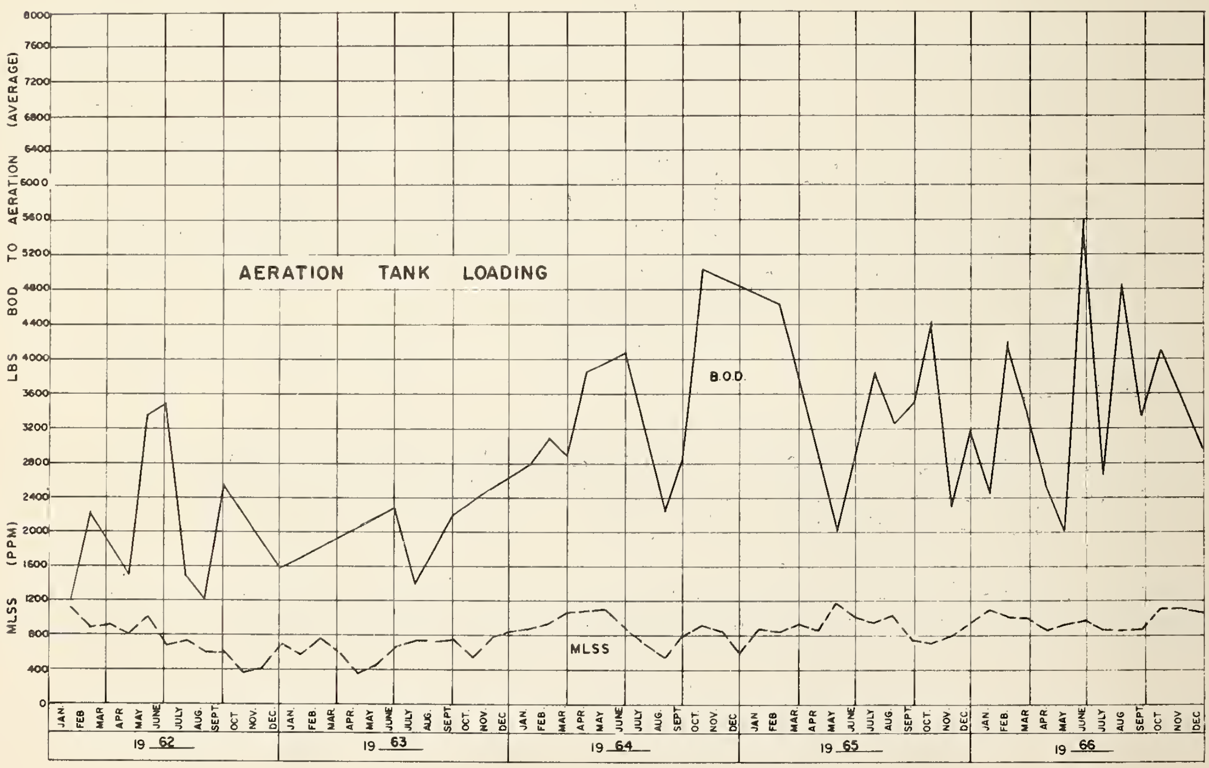
* average value substituted. Sample broken

COMMENTS

An average loading of 375 ppm 5 day BOD and 773 ppm SS was experienced in 1966. The average BOD and SS in the final effluent was 23 and 33 respectively, both being in excess of the OWRC objectives of 15 ppm.

Although the grit removed was 7.8 cu. ft. per million gallons in 1966, a slight reduction from 8.15 cu. ft. per million gallons in 1965, it is still higher than average.


AERATION TANK PERFORMANCE


AERATION TANK LOADING

AERATION SECTION

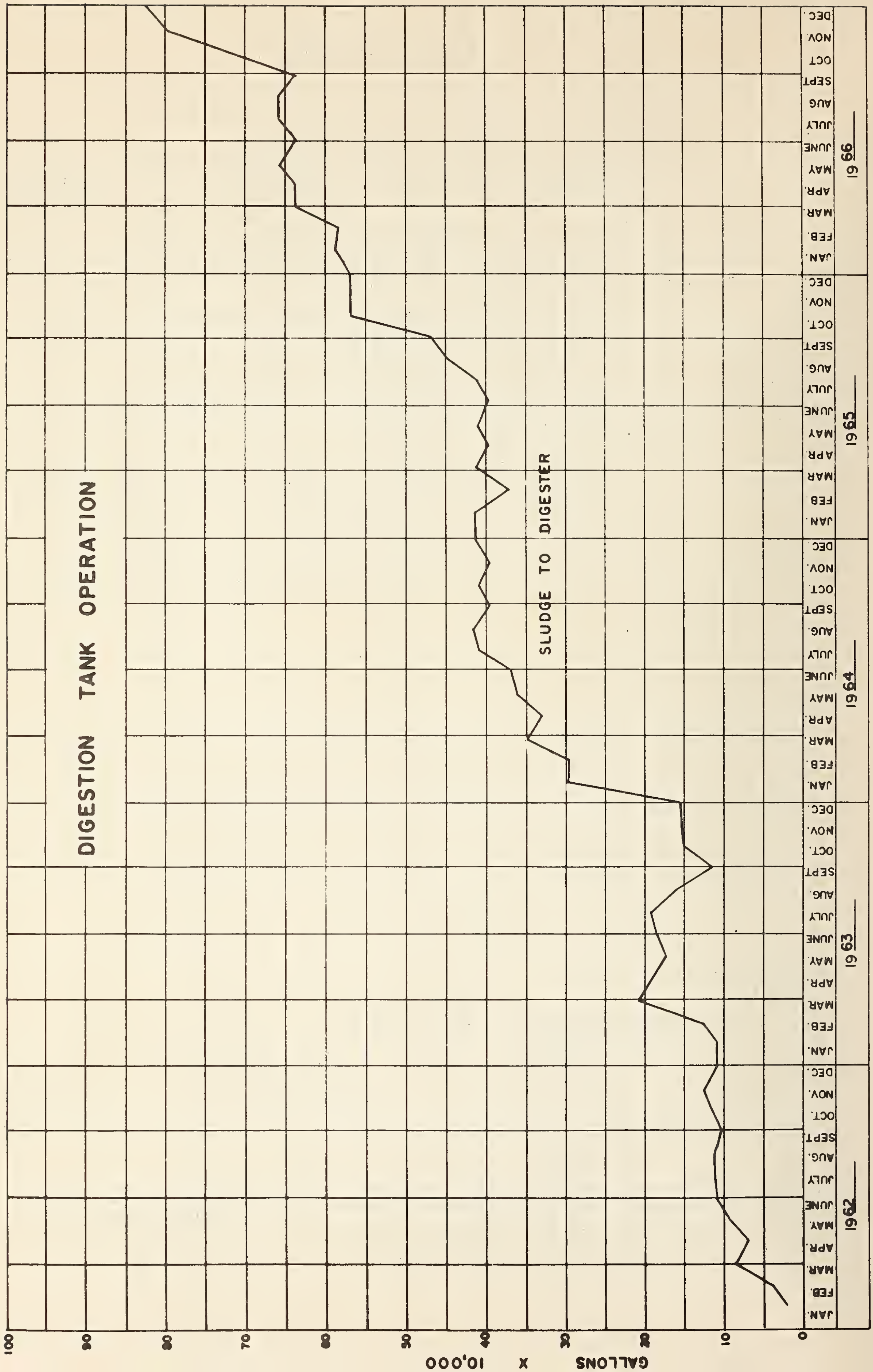
MONTH	PRIM. EFFL B.O.D. P.P.M.	M.L.S.S. P.P.M.	LBS. B.O.D. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. B.O.D. REMOVED
JANUARY	110	1074	40	1305
FEBRUARY	178	996	74	654
MARCH	122	964	62	793
APRIL	95	837	53	1674
MAY	82	894	39	1548
JUNE	210	951	103	498
JULY	110	829	56	1215
AUGUST	185	844	101	579
SEPTEMBER	118	853	68	841
OCTOBER	136	1100	65	-
NOVEMBER	122	1100	56	885
DECEMBER	110	1059	50	1057
TOTAL	-	-	-	-
AVERAGE	132	958	64	1004

COMMENTS

The normal figures for the above table would be:

Prim. Eff. BOD	MLSS	lb. BOD per 100 lb. MLSS	Cu. Ft. Air per lb. BOD removed
150	2000-2500	30-50	1200

Since available air is the non variable the MLSS must be adjusted down to give the necessary air ratio of 1200 cu. ft. per pound BOD removed. This in turn gives an unusually high figure of 64 pounds BOD per 100 pounds SS.


DIGESTION TANK OPERATION
SLUDGE TO DIGESTER
GALLONS X 10,000
0
10
20
30
40
50
60
70
80
90
100
JAN.
FEB.
MAR.
APR.
MAY.
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
1962
1963
1964
1965
1966

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU FT	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT	
JAN.	93.64	-	-	-	-	-	
FEB.	86.87	3.14	-	-	1.73	-	
MAR	101.54	-	-	-	-	-	
APR.	101.54	2.99	2.24	19.46	2.60	1.64	
MAY	104.923	2.03	-	39.67	3.46	-	
JUNE	101.54	-	-	19.99	-	-	
JULY	104.92	-	-	47.72	-	-	
AUG.	104.92	-	-	44.83	-	-	
SEPT.	101.54	-	-	51.75	-	-	
OCT.	114.23	-	-	38.67	-	-	
NOV.	126.92	-	-	58.41	-	-	
DEC.	131.15	3.60	-	47.21	1.10	-	
TOTAL	1273.73	-	-	367.61	-	-	
AVG.	106.14	2.94	2.24	30.64	2.22	1.64	

COMMENTS

The volume of sludge pumped to the digesters was 1,273,730 cubic feet. Of this amount, 367,710 cubic feet was removed by tank truck.

The balance of sludge, which would normally have been supernated through the plant, was run out to adjacent farm fields.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (P.P.M)
JANUARY	68.412	3100	4.53
FEBRUARY	65.505	2800	4.27
MARCH	85.173	3079	3.61
APRIL	79.722	2780	3.49
MAY	75.421	2855	3.78
JUNE	79.363	3555	4.48
JULY	74.317	5585	7.52
AUGUST	81.264	5390	6.63
SEPTEMBER	83.918	5145	6.13
OCTOBER	92.709	5300	5.72
NOVEMBER	86.428	5220	6.04
DECEMBER	84.367	4258	5.05
TOTAL	956.599	49067	-
AVERAGE	79.717	4089	5.13

COMMENTS

Year-round chlorination is conducted at this plant. A total of 49,067 pounds of chlorine was used during 1966 at an average dosage of 5.13 ppm.

CONCLUSIONS

During 1966, plant facilities were overloaded hydraulically at least 90% of the time, while the average 5 day BOD of the raw sewage was 375 ppm and the average SS content was 705 ppm.

Construction of the 3 mgd extension was carried out throughout 1966, and it is probable that the plant, when enlarged to 5 mgd, will soon be running at capacity.

Despite the adverse conditions at the plant, morale was high, and treatment efficiency was exceptionally good.

Date Due

AUG 3 1 1971

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS.

BRAMPTON - CHINGUACOUSY - WATER
POLLUTION CONTROL PLANT.
OPERATING SUMMARY 1966

MOE/BRA/WAT/1966/ASFA

DATE	C.1 ISSUED TO asfa
17 Aug. 71	J. McGRACHAN (Research)

MOE/BRA/WAT/1966/ASFA
Ontario Water Resources Co
Brampton -
Chinguacousy water asfa
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